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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,578	02/27/2004	Andrew P. Nguyen	6601.P046	9132

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EXAMINER

TADESSE, YEWEBDAR T

ART UNIT	PAPER NUMBER
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1734

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/788,578

Applicant(s)

NGUYEN, ANDREW P.

Examiner

Yewebdar T. Tadesse

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) 33-42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 06/04.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-5, 18-20 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagamine (US 6,715,943) in view of Tsukamoto et al (US 5,993,552).

As to claims 1, 3-5, 18-20, and 28, Nagamine discloses (see Fig 6) a semiconductor substrate processing apparatus comprising a frame (15); a substrate support (spin chuck 71) mounted to the frame to support a semiconductor substrate; a dispense head having at least one outlet opening (nozzle 90,91); connected to the frame for movement relative to the semiconductor substrate (W); a solvent bath (washing tanks 98,99) attached to the frame having a reservoir holding a first fluid, a

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casing with a chamber (recessed shaped cross-sections for receiving developing solution supply nozzles), and the dispense head having first and second selected positions (in the first position developing solution dispensed through nozzles and in the second selected position nozzles are kept in the washing tanks). Nagamine lacks teaching a solvent bath having a drain and the formation of the solvent bath such that when the dispense head is in a selected position, a second fluid dispensed from the at least one outlet opening enters the drain and the at least one outlet opening is exposed to the first fluid. Tsukamoto et al discloses (see Figs 15-16) a solvent bath (106) having a drain (108) and the solvent bath is shaped when the dispense head is in a selected position (the resist applying machine is not in use) the second fluid dispensed from the at least one outlet opening (nozzle 104) enters the drain (108) and at least one outlet opening is exposed to the first fluid (solvent supplied through 107). See also Fig 16 for the nozzle 104 inserted into one of the openings of the chambers of the solvent bath 106 casing. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a solvent bath having a drain and wherein a second fluid dispensed from the at least one outlet opening enters the drain and the at least one outlet opening is exposed to the first fluid in Nagamine to replace the soaking fluid in the reservoir as much as needed preventing contamination of the dispensing head.

As to claim 2, in Nagamine (see columns 8-9, lines 53-67 and 1-23 respectively) the dispense head (nozzles 90, 91) is movable between a first position and a second position relative to the semiconductor substrate.

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4. Claims 6-17, 21-27 and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagamine (US 6,715,943) in view of Tsukamoto et al (US 5,993,552) as applied to claims 1, 18 and 28 above, and further in view of JP2001-205162A (see English translated Abstract and detailed description). As to claims 6-8 and 21-23, Nagamine as modified lacks teaching air in the chamber of the solvent bath saturated with evaporated fluid from the reservoir, wherein the nozzle does not contact the first liquid in the reservoir and no saturated air leaving the chamber through the opening in the casing. JP'162 discloses (see Fig 3, English translated abstract) a nozzle cleaning apparatus forming cleaning atmosphere by evaporating cleaning liquid from the reservoir, wherein the nozzle does not contact the cleaning liquid (21) and no saturated air leaving the chamber through the opening in the casing (i.e. seal is formed between the nozzle and the supporting structure of the washing station, see paragraph 15). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use air in the chamber of the solvent bath saturated with evaporated fluid from the reservoir, wherein the nozzle does not contact the first liquid in the reservoir and no saturated air leaving the chamber through the opening in the casing to effectively clean the nozzle.

With respect to claims 9-13, 24-27 and 29-32, Nagamine lacks teaching the structure of the washing tank or solvent bath. Although one in the art would design the solvent bath as desired to efficiently conduct the cleaning operation of the dispense head. Tsukamoto et al and JP'162 discloses (see Figs 16 and Fig 3 respectively) a solvent bath with casing comprising a base, side wall, a top piece, wherein the drain

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and the reservoir are attached to the base of the casing, the opening is in the top piece of the casing and the side wall interconnects the base and the top piece, a funnel structure connected to the drain (see Tsukamoto et al's Fig 16), and the reservoir surrounding the funnel structure. It would have been obvious to one of ordinary skill in the art at the time the invention was to construct the solvent bath as claimed in Nagamine as modified to conduct the cleaning operation of the nozzle by evaporating the cleaning liquid as taught in JP'162.

Regarding claims 14-18, in Nagamine the first and second components are liquids or semiconductor processing liquids or first fluid is solvent (water), the second fluid is photoresist (resist, see column 2, line 30 and column 9, line 22), and the first and the second fluid capable of having at least one component in common. Both Tsukamoto et al and JP'162 teaches (see column 9, lines 41-50 and paragraph 1 respectively) these fluids – photoresist and solvents.

Response to Arguments

5. Applicant's arguments filed 07/12/2005 have been fully considered but they are not persuasive. Applicant mainly argues that Nagamine and Tuskamoto et al individually or in combination do not disclose "the solvent bath is shaped such that when the dispense head is in a selected position in the solvent bath, the second fluid dispensed from the at least on outlet opening enters the drain and where at least one outlet opening is exposed to the first fluid" as recited in Claim 1. Examiner disagrees. First, it is true that Nagamine does not discloses a drain for the solvent bath (washing tanks).

However, Tuskamoto et al as shown in the rejection above and Fig 16, discloses the drain and applicant's claimed limitation that are not taught by Nagamine. It is presented again the limitations of Claim 1, that applicant argues not met by Tuskamoto et al is as follow:

"The solvent bath (106) is shaped such that when the dispense head (104) is in a selected position (the resist applying machine is not in use) in the solvent bath (106), the second fluid dispensed from the at least one outlet opening (some left over resist from the nozzle) enters the drain (108) of the solvent bath, and where at least one outlet opening is exposed to the first fluid (solvent)".

Tuskamoto et al clearly meets the claimed elements and the intended use limitation as described above. Applicant argues that Tuskamoto did not teach that fluid in the nozzle is being dispensed or purged through a drain". Examiner disagrees because in the process of soaking or washing using Tuskamoto et al's solvent bath, the second fluid combined with solvent is considered to be purged through the dispensing nozzle outlet. Basically, the second fluid (processing fluid or resist) entering the drain of the solvent bath is not just the second fluid, however, in using Tuskamoto et al's solvent bath the nozzle 104 could be drained (from some left over fluid) before the solvent is supplied to the bath through the supply line 107 – satisfying the limitation, i.e. " the second fluid dispensed from the at least one outlet opening enters the drain of the solvent bath. Nagamine discloses solvent bath (washing tanks) and Tuskamoto et al discloses a solvent bath with a drain as described in the rejection above. One in the art would combine Tuskamoto et al with Nagamine to replenish the solvent bath with a clean

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solvent in the process of purging or cleaning the nozzle outlet. As such Nagamine and Tuskamoto et al meets the claimed limitation. It is noted that applicant further limits (see claim 5) the apparatus having an opening, a reservoir within the chamber to hold a fluid and a drain within the chamber. Tuskamoto et al also meets these elements of the apparatus as shown in Fig 16.

6. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yewebdar T. Tadesse whose telephone number is (571) 272-1238. The examiner can normally be reached on Monday-Friday 8:00 AM-4: 30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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